Math 1010 – Exam 3 Review

1. Find the domain of the rational function: $f(x)=\dfrac{3}{x-6}$

2. Find the function value, provided it exists: $f(x)=\dfrac{2x^2+5x}{x-3}$; find $f(-2)$

3. Simplify by removing a factor equal to 1: $\dfrac{3x^2y^5}{6xy^8}$

4. Simplify by removing a factor equal to 1: $\dfrac{x^2+5x-6}{x^2+2x-3}$

5. Write in simplified form and list all restrictions on the domain: $f(x)=\dfrac{3-2x}{4x^2-9}$

6. Multiply and simplify: $\dfrac{x^2-4}{2x+6}\cdot\dfrac{x+3}{x^2+7x+10}$

7. Divide and simplify: $\dfrac{4x^3}{x^2-x-12}\div\dfrac{2x}{3x-12}$

8. Perform the indicated operations, and, if possible, simplify: $\dfrac{x^2-3x-18}{6x}\div\dfrac{x+3}{x+6}\cdot\dfrac{x^2-6x}{x^2-12x+36}$

9. Perform the indicated operation and simplify: $\dfrac{4}{x+y}+\dfrac{2x-1}{x+y}$

10. Find the simplified form for $f(x)$ and list all restrictions on the domain:
    $f(x)=\dfrac{x-1}{x^2+3x-40}-\dfrac{2x+15}{x^2+3x-40}$

11. Perform the indicated operation and simplify: $\dfrac{x}{x-3}-\dfrac{2}{x+5}$

12. Perform the indicated operation and simplify: $\dfrac{x+1}{x^2-2x-8}+\dfrac{2x+4}{x^2-16}$

13. Perform the indicated operation and simplify: $\dfrac{3}{x-5}+\dfrac{2}{5-x}$

14. Simplify: $\dfrac{\dfrac{5}{x}-\dfrac{3}{2y}}{\dfrac{1}{2x}+\dfrac{7}{y}}$

15. Simplify: $\dfrac{\dfrac{6}{x^2-25}-\dfrac{1}{x-5}}{\dfrac{5}{x^2-25}+\dfrac{6}{x+5}}$

16. Solve: $\frac{2}{x}+\frac{5}{2x}=3$

17. Solve: $\frac{2}{t}=\frac{t}{5t-12}$

18. Solve: $\frac{6}{m-3}-\frac{9}{m+3}=\frac{3}{m^2-9}$

19. Solve: $\frac{y}{y+4}+\frac{8y+28}{y^2+7y+12}=\frac{4}{y+3}$

20. Find all values of a for which $f(a)$ is the indicated value: $f(x)=2x-\frac{5}{x}; f(a)=-3$

21. The sum of a number and four times its reciprocal is -5. Find the number(s).

22. Martha can rake the leaves in a yard in 3 hours. Her little brother can do it in 5 hours. How long will it take them to do the job if they work together?

23. It takes Jeff 5 hours longer to build a fence than it takes Bill. When they work together, it takes them 6 hours. How long would it take Bill to do the job alone?

24. A boat can go 7 mph in still water. It takes the same amount of time to go 4 miles upstream as it does to go 10 miles downstream. Find the speed of the current.

25. A boat travels 45 mi upstream and 45 mi downstream in a total time of 8 hr. The speed of the current is 3 mph. Find the speed of the boat in still water.

26. Divide: $\frac{-10x^3y^2+2x^2y^3+4xy^2}{-2x^2y}$

27. Divide: $(5m^2+37m-72)\div(m+9)$

28. Divide: $(p^2+2p-8)\div(p+5)$

29. Divide: $(2r^3+5r^2-13r-10)\div(r-2)$

30. Divide: $\frac{-4x^3-10x^2-2x+16}{2x+1}$

31. Solve the formula for the specified letter: $I=\frac{2V}{R+2r}$, for r

32. Solve the formula for the specified letter: $\frac{1}{a}+\frac{1}{b}=\frac{1}{t}$, for t

33. Solve the formula for the specified letter: $L=\frac{dR}{D-d}$, for d

34. Solve the formula for the specified letter: $P=\frac{A}{1+r}$, for r